CLAIMS

1. A process for reconstruction of a tomographic image of an especially mobile and deformable object, the image being a set of values of a property taken by points of the object, comprising the use of: divergent radiation from a focal point and passing through the object, the focal point being mobile about the object; an analytical model of mobility and deformation of the object defined for each position of the focal point; and an analytical calculation process for obtaining said values from totals of the values of the property along projection lines leading to the focal point and passing respectively by the points; characterised in that the model is improved, and is a variable combination being acquired, this combination comprising translations, rotations and homotheties of the object from an origin, and in that the process of analytical calculation comprises the following stages:

- weighting of the measurements, this weighting being dependent on the analytical model of mobility and deformation of the object;
- derivation of the measurements weighted following the trajectory of the focal point considering a direction adapted to the model, this direction being kept constant, and obtaining modified measurements;
- retroprojection of the modified measurements.

2. The process for reconstruction of an image as claimed in Claim 1, characterised in that it comprises a step of integration interval definition giving $f_0\left(\overrightarrow{x_0}\right)$ such that the projection lines have directions extending over an interval of N semi-turns considered in a state of the object where the image is reconstructed, N being greater than or equal to 1.

3. The process for reconstruction of an image as claimed in any one of Claims 1 or 2, characterised in that it is applied with a particular analytical mobility and deformation model at each point of the object.

4. The process for reconstruction of an image as claimed in Claim 3, characterised in that the improved linear part of the particular analytical model corresponds to the improved local approximation
of a family of trajectories passing through points located in the region of each point.

5. The process for reconstruction of an image as claimed in Claims 2 and 3, characterised in that the directions of the projection lines are considered at the point of the object where the process is applied.

6. The process for reconstruction of an image as claimed in any one of Claims 1 to 5, characterised in that reconstruction is carried out first by sub-images constructed with projection lines having directions in the angular intervals smaller than a semi-turn, in that it comprises a stage of determining the angular intervals to which the projection lines belong, and in that it comprises a stage of combining the sub-images after correction of the general law of evolution of the object between the positions associated with different reference instants associated with each angular interval.

7. The process for reconstruction of an image as claimed in any one of the preceding claims, characterised in that the general law of evolution of the object is periodical and in that the reference instants are selected for the same phase of periods of movement of the object.

8. The process for reconstruction of an image as claimed in any one of the preceding claims, where radiation is conical, characterised in that prior to the step of filtering the acquired measurements, the process comprises a stage of weighting the acquired measurements adapted to acquisition of the measurements in conical geometry and in that the retroprojection is performed according to the conical geometry by taking into consideration the analytical model of mobility and deformation of the object.

9. The process for reconstruction of an image as claimed in any one of the preceding claims, characterised in that weighting of the measurements is preceded by filtering the measurements acquired by a Hilbert filter.

10. The process for reconstruction of an image as claimed in any one of the preceding claims, characterised in that the improved model is obtained by approximation of real deformations of the object according to an approximation criterion.